EXECUTIVE SUMMARY

AIRCRAFT ACCIDENT INVESTIGATION
C-17, SERIAL NUMBER (S/N) 92-003294
58TH AIRLIFT SQUADRON (AS), ALTUS AIR FORCE BASE (AFB), OKLAHOMA
25 JUNE 2003

On 25 June 2003, at approximately 1427 Central Daylight Time (CDT), the mishap aircraft (MA), a C-17, S/N 92-003294, experienced a fire in the vicinity of the number one engine. The aircraft had completed the flight portion of an instructor pilot upgrade syllabus mission and was practicing ground maneuvering. The aircraft was shut down, the crew egressed safely with no injuries, and the fire department responded to the scene. Upon arrival, smoke and flames were billowing from the number one engine nacelle and pylon and after attempts to extinguish the fire with water failed, the firefighters used Aqueous Film Forming Foam (AFFF) which coated the internal and external areas of engine number one until the smoke and flames subsided. The engine was required to be removed from the wing and disassembled for damage inspection. Teardown analysis and the cost of engine refurbishment were valued at $1.703 million by the aircraft and engine manufacturers. There were no injuries as a result of this mishap. The incident was on government property and no claims for damage to private property have been filed as a result of this mishap.

The Accident Investigation Board president found clear and convincing evidence the MA engine core thrust reverser (T/R) deploy hydraulic hose burst upon activation of the T/R during a practice backing maneuver. Investigation revealed that the subsequent leak of hydraulic fluid dripped onto the hot casing of the turbine section of the number one engine, igniting the fluid and causing a fire to burn on top of the core engine turbine section and below the wing pylon. The "internal" nature of the fire did not allow firefighters to effectively fight the fire with water. Firefighters went into the aircraft and employed the internal fire extinguishing system in conjunction with AFFF that coated and cooled the engine and pylon areas of the aircraft.

After 97 AMW/MX supervision consulted with the aircraft manufacturer (Boeing), a decision was made to remove the engine and send it to the manufacturer (Pratt & Whitney) for disassembly and inspection due to the potentially corrosive effects of AFFF on internal engine components.

Examination of the ruptured hydraulic hose indicated both design deficiencies and installation discrepancies induced stresses beyond the hose manufacturer's tolerances. Bend radius, hose twist, and temperature in the hose compartment contributed to shortening the life of the hose. Also, technical order ambiguity regarding aircraft fire-extinguishing bottle employment during an engine fire substantially contributed to the cost of the mishap.